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Astronomers report evidence of 'dark energy' splitting the universe

By Dennis Overbye

By comparing maps of heat emanating from the fading remnants of the Big Bang to maps of the modern universe, astronomers say they have uncovered evidence that some "dark energy" is wrenching the universe apart.

The new work, they said, provides independent confirmation of one of the strangest astronomical findings in recent years, that based on studies of distant exploding stars the expansion of the universe is speeding up.

The simplest explanation, astrophysicists say, is that space is imbued with a repulsive, or antigravitational, force first hypothesized in 1917 by Einstein and known as the cosmological constant. But nobody understands this so-called dark energy, although speculations have blossomed in the physics literature in the last few years.

Using the maps, a multinational team of 33 astrophysicists, led by Dr Ryan Scranton of the University of Pittsburgh, found what the members called "the shadow of dark energy" in the form of a slight boost in the energy of the radiation from the Big Bang as it passed through huge clouds of galaxies. The astronomers said their results represented an important validation of dark energy and the emerging consensus of a universe dominated by mysterious dark matter and even more mysterious dark energy, which is geometrically "flat." That means that parallel lines drawn across the cosmos will not meet.

"This result is the piece of physical evidence that really closes the door," said Dr Robert Nichol, an astrophysicist at Carnegie Mellon. Many physicists had taken a wait-and-see attitude about the dark energy acceleration, Dr Nichol said. An astronomer at the Space Telescope Science Institute in Baltimore, Dr Adam Riess, said dark energy was becoming "the great cosmological detective story of today."

"If we can just keep collecting a few more clues about it," Dr Riess added, "we might actually be able to figure out what the heck it is." The results were obtained by combining information from the Sloan Digital Sky Survey, which is mapping the distances and positions of more than a million galaxies, with the Wilkinson Microwave Anisotropy Probe of NASA.



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The probe, a satellite, is busy mapping the intensity of a faint cosmic microwave radiation that fills the sky and is presumed to represent heat emanating from the remains of the Big Bang when the universe was only 380,000 years old.

The cosmic radiation is rippled with hot and cool spots. Some are a result of lumps in the primordial cosmic gravy and are the seeds of galaxies and other conglomerations of matter. But other hot spots, theorists point out, may be generated by the passage of microwaves through the modern universe. —NYT

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